PROVISIONAL SPECIFICATION

EMI8800 MAGNETIC TAPE HANDLER

UNIVERSAL BUFFERED INTERFACE

Suitable for:
8 Bit Parallel ('Centronics' Compatible)
IEC/IEEE 488
V24 (RS232C)

1.1. INTRODUCTION

The Universal Buffered Interface is a single printed circuit board which mounts on the rear of the EMI 8800 Transport and is interfaced to the transport mounted dual formatter.

The board has the following main components:

(i) An Intel 8748 microprocessor with an associated 1K of EPROM.

(ii) 4K bytes RAM.

1.2. RECORD LENGTH

Equal or less than buffer length

1.3. INTERFACES

1.3.1. 8 bit parallel interface with "Centronics" compatible Strobe/ Acknowledgement handshaking.

1.3.2. IEC/IEEE 488 Interface PCB, further details on request.

1.3.3. Serial V24 (RS232C) Interface can be provided as an alternative to 1.3.1. on the same PCB.

Serial input and output performed by Universal Asynchronous Receiver Transmitter (UART). Factory pre-set character format

1 start bit
7 data bits
1 parity bit
1 stop bit

Other standard character formats may be pre-set as required.

1.4. DATA TRANSFER RATES

Parallel 0-1M characters per second.
Serial 600, 1200, 2400, 4800, 9600, 19200 bauds selectable. Other speeds available on request.

The upper limit will normally be defined by the average transfer rate of the magnetic tape transport e.g.

....Tape

Tape speed 45ips
Packing density 1600BPl
Block size 2048 bytes
Interblock Gap •6 in.
Average transfer rate 47.5Kcps

without allowing for rewriting where tapes may be faulty.

"Burst" rates may be handled to the maximum.

PRINCIPLE OF OPERATION

2.1. The system can perform 12 different commands: write one block on tape, read on block, space one block in formward direction, backspace one block, rewind, rewind and lockout, write file mark, write continuous, read continuous, clear and edit.

The DLE character (HEX 10) must be transmitted before every command code. The 8 bits character following DLE defines the command.

2.2. FORMATTING

In write mode the system generates IBM or ECMA compatible format for NRZ or PE and includes logic for generation of all check characters, file marks and all other format requisites (ID burst, preamble, postamble) for the corresponding recording format.

In read mode the system automatically checks and strips all check and format characters and presents only valid data characters, block length characters and status words as described on the following page.

SPECIFICATIONS

3.1. Tape Speed - Normally 45ips others on request.

3.2. Reel Size

10.5 inches industry compatible (2400 feet tape length)
N.B:- 10.5 inches unit may also take 8.5" or 7" reels.

3.3. Recording Formats

9 track dual NRZ/PE

7 or 9 tracks NRZ

9 tracks PE

COMMANDS EXECUTION

Write One Block on Tape

4.1. Following characters must be sent by the users equipment:

.....1. - DLE

1. - DLE (HEX 10)
2. - WRITE CODE (HEX 31, ASCII 1) 49
3. - MOST SIGNIFICANT BYTE OF BLOCK LENGTH (BLM.) (6 BITS of 12b WORD) 12 bits
4. - LEAST SIGNIFICANT BYTE OF BLOCK LENGTH (BLL) (6 BITS of 12b WORD)
5. - DATA WORDS

quindi l max 4096

The data words are stored in a static RAM. When the number of data is equal to the binary number defined by BLM and BLL the content of the memory is transferred onto tape. At the end of this operation two status bytes are transmitted to the users equipment. Composition of both status bytes is explained in 4.10 describing status request command.

If a parity error is detected during the read after write check the system tries automatically 3 times to write data, erasing 3 inches tape, before rewriting the data at a new position.

In case of parity error persisting after 3 retry sequences the tape stops moving and status bytes are transmitted.

Other retry sequences available on request.

Write Continuous.

4.2. Following characters must be sent by the users equipment.

1. - DLE (HEX 10)
2. - WRITE CONT CODE (HEX 39,ASCUII 7)
3. - MOST SIGNIFICANT BYTE OF BLOCK LENGTH (BLM) (6)
4. - LEAST SIGNICANT BYTE OF BLOCK LENGTH (BLL) (6)
5. - DATA WORDS

The operation is the same as a Write one block, except that after the data words are written to tape, the controller will accept more data. Therefore, a 2nd block can be written to tape without the need for the user to re-issue another write command sequence.

The write continuous instruction will terminate after an unrecoverable parity Error, at which time both status bytes are transmitted. The block lengths of all blocks written to tape will be the same.

4.3. Read One Block From Tape.

1. - DLE (HEX 10)
2. - READ CODE (HEX 30, ASCII 0)

After detection of READ code, tape starts moving, the data block is stored in the buffer memory. When the tape has stopped the following characters are transmitted to the users equipment.

1. - STATUS BYTE 1
2. - STATUS BYTE 2
3. - MOST SIGNIFICANT BYTE OF BLOCK LENGTH (6)
4. - LEAST SIGNIFICANT BYTE OF BLOCK LENGTH (6)

..... 5. - DATA

5. - DATA CHARACTERS

If a parity error is detected the system tries 3 times to read the block. If the block is still in error after 3 retries both status bytes are transmitted.

4.4. Read Continuously.

1. - DLE (HEX 10) 56

2. - READ CONT CODE (HEX 38, ASCII 8)

After detection of the Read Cont code, tape starts moving, the data block is stored in the buffer. When the tape has stopped the following characters are transmitted to the users equipment.

A1 STATUS BYTE 1

A2 STATUS BYTE 2

A3 MOST SIGNIFICANT BYTE OF BLOCK LENGTH (6)

A4 LEAST SIGNIFICANT BYTE OF BLOCK LENGTH (6)

A5 DATA CHARACTERS

After all the data Characters have been accepted by the user, the tape will start moving again and another block will be Read, the sequence of events will now be the same, re-entering the sequence at point A1. The Read Cont instruction will terminate on an unrecoverable parity error, or detection of a File Mark character.

4.5 Space Forward One Block

Characters to be transmitted:-

1. - DLE (HEX 10)

2. - SPACE FORWARD CODE 9 HEX 32, ASCII 2)

After detection of space forward code the tape starts in forward direction, space one block and stops in the inter record gap. At the end of the operation both status bytes are transmitted.

4.6. Space Reverse One Block.

1. - DLE (HEX 10)

51

2. - SPACE REVERSE CODE (HEX 33, ASCII 3)

Same operation as 4.5 but in reverse mode.

4.7. Rewind

1. - DLE (HEX 10)

2. - REWIND CODE (HEX 34, ASCII 4)

After detection of rewind code tape starts rewinding and stops on BOT (Load point). At the end of the operation both status bytes are transmitted.

.... 4.8.

4.8. Rewind and Lockout

1. - DLE (HEX 10)

55

2. - REWIND AND LOCKOUT CODE (HEX 35, ASCII 5)

After detection of this code tape starts rewinding, goes offline and stops on BOT.

4.9. Write File Mark

1. - DLE (HEX 10)

54

2. - WRITE FILE MARK CODE (HEX 36, ASCII 6)

After detection of WFM code the tape drive first erases 3" tape and writes file mark code (HEX 13 in 800 CPI NRZ, 40 "zero's" on tracks P, 0, 2,5,6,7 while tracks 1,3, 4 erased in 1600 CPI PE). When tape stops both status bytes are transmitted.

4.10. Status Request

1. - DLE (HEX 10)

55

2. - STATUS REQUEST CODE (HEX 37, ASCII 7)

When status request is decoded both status bytes are transmitted.

4.10.1 First Status Byte (SB 1)

1 BIT 0: - CBY

True when a command is accepted and remains true until the operation has finished and all motion has ceased. 0↗

2 BIT 1: - REJECT - formatter busy and any command is issued
- reverse command on BOT
- write or write file mark without write enable ring on the reel.

- NON VALID COMMAND CODE
- TAPE UNIT NOT READY x
- PARITY ERROR

1600 CPI PE - correctable error
- uncorrectable error
- false preamble or postamble
- multitrack dropout

800 CPI NRZ - longitudinal parity error
- vertical parity error

4 BIT 2: - REJECT
- NOT CORRECTLY TRANSMITTED COMMAND 0↗

8 BIT 3: - always "0"

S1: S1 And 7

16 BIT 4: - " "1" Toggle → 0

48 +

32 BIT 5: - " "1" const.

64 BIT 6: - " "0" toggle → 1

128 BIT 7: - " "0" const

.....N.B.

N.B. CBY Bit 0 will be set during any Read instruction, until all the data has been accepted by the user.

4.10.2 Second Status Byte (SB 2)

1 BIT 0: - LOAD POINT (BOT) x
2 BIT 1: - END OF TAPE (EOT) x
indicates transport is on or has passed over the end of tape reflective tab. This signal remains true until a reverse direction command is accepted by the system.

4 BIT 2: - REJECT
8 BIT 3: - FILE MARK x
16 BIT 4: - PARITY ERROR x
- TIMING ERROR
32 BIT 5: - Always "1"
64 BIT 6: - " "1"
128 BIT 7: - " "0"

S2 = S2 AND 31

96+

Both status bytes are always transmitted together:-

- After execution of a WRITE command, a SPACE FORWARD a SPACE REVERSE, a REWIND and a WRITE FILE MARK command.
- In READ, status bytes are transmitted after transfer of the block from tape to memory, before transmitting BLM, BLL and data to users equipment.
- Immediately after reception of a STATUS REQUEST command.
- If character following DLE is not a correct command code.
- If a parity error is detected in a received character.
- When a command is rejected by the formatter.

4.11. Clear

1. - DLE
2. - CLEAR COMMAND (HEX 3A ASCII:) 58

The Clear Command Resets all control logic in the formatter terminating any instruction if present, and terminating any tape motion.

4.12. Edit

1. - DLE
2. - EDIT COMMAND (HEX 3B ASCII;) 59

The 'edit' command allows the user to alter specific blocks of data. The sequence is as follows:-

- Read one data block
- Issue 'edit' (Hex 3B ASCII)
- Space back one block
- Write one data block.

The 'edit' command is now automatically reset. 'Edit' may also be reset by the Clear command (see para 4.11)

The 'edit' function effectively adjusts the tape position so that the new data exactly replaces the original data block, also allowing for the start/stop times. Caution should be exercised in ensuring that new data is of the same block length as the original record.

.....5. COMMANDS.

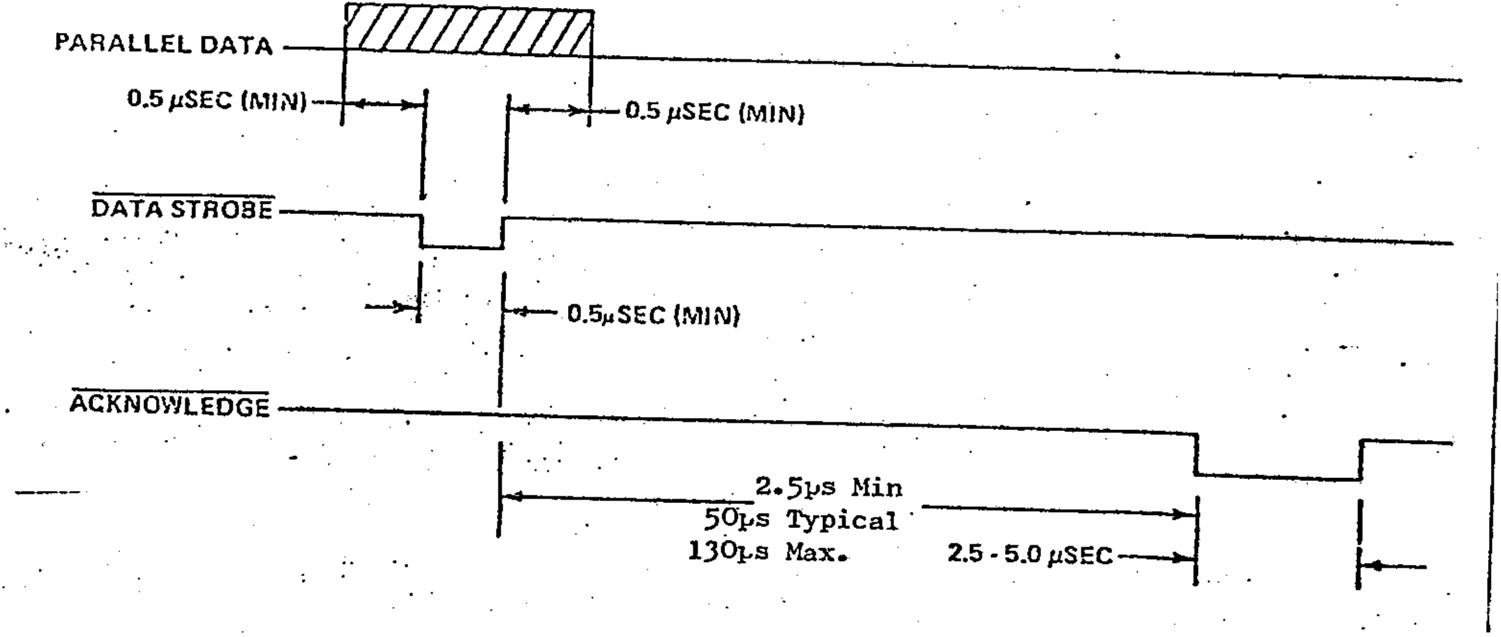
5. COMMANDS CODE CHART

COMMAND	HEXADECIMAL CODE	ASCII	BIT 0	1	2	3	4	5	6	BIT 7
DLE	10	DLE	0	0	0	0	1	0	0	0
WRITE	31	1	1	0	0	0	1	1	0	0
READ	30 48	0	0	0	0	0	1	1	0	0
SPACE FORWARD	32	2	0	1	0	0	1	1	0	0
BACKSPACE	33	3	1	1	0	0	1	1	0	0
REWIND	34	4	0	0	1	0	1	1	0	0
REWIND & LOCKOUT	35	5	1	0	1	0	1	1	0	0
WRITE FILE MARK	36	6	0	1	1	0	1	1	0	0
STATUS REQUEST	37	7	1	1	1	0	1	1	0	0
READ CONT	38	8	0	0	0	1	1	1	0	0
WRITE CONT	39	9								
CLEAR	3A	:	0	1	0	1	1	1	0	0
EDIT	3B	;	1	1	0	1	1	1	0	0

48 - 59

5.10.79 PLW/DJ

TIMING



Pin connections (8 bit parallel

SIGNAL	INPUT PIN	OUTPUT PIN
data 1+	17	39
data 2+	13	41
data 3+	9	45
data 4+	11	43
data 5+	15	33
data 6+	19	31
data 7+	21	47
data 8+	25	35
Strb -	23	29
Ack -	5	37
Rdy +	49	1
+5 V PINS 2&50		
Reset (µp generated reset O/P- no conn. necessary)		3
ALE (µp clock pulses O/P - no conn. necessary)		7
GROUND 4 - 48 even pins.		

Connector - standard 50 way ribbon cable

SERIAL PORT CONNECTOR

PIN		SIGNAL
1		-12V VIA 10K
2		+12V VIA 10K
3		OV
4	NC	
5		DSR (not examined)
6	NC	
7		RX DATA TO TAPE UNIT
8		TX DATA FROM TAPE UNIT
9	NC	
10		DTR - SET + TRUE AFTER INITIALISATION

INSTALLATION

Connect OV and +14V Power

Leads to terminal block on back of metal panel.

Fit PCB to panel with SE Labs plastic mounting pillars.

REMOVE three 220/300 resistor packs from bottom of transport mounted formatter - Fit 3 2K2 Resistor Packs

Fit ribbon cable from lower connector RC3 to 136 way edge connector.
Attach flying resistor to formatter heat sink.

SW1 in position IC110

Baud Rate Switch

1 - 38400 (N/A ?)

2 - 19200

3 - 9600

4 - 4800

5 - 2400

6 - 1200

7 - 600

8 - 300

Link closed for selected speed.

.....cont'd.

SW2 in position IC105

Serial character configuration

1 No Parity - High gives no parity
2 TSB - Low gives 1 stop bit
3 NB2 -
4 NB1 -
5 O/EPS - LK to GND for ODD Parity
6 $\overline{\text{SWE}}$ - LK to GND for serial CH. Enabled
7 PARALLEL - LK to GND for Parallel Operation

NB2	NB1	DATA BITS/CHAR
L	L	5
L	H	6
H	L	7
H	H	8

E.G. for 7 bits plus even parity, 2 stop bits
Links to GND 1, 4, 6
(HIGHS ON 2, 3, 5, 7)

NOTE - SERIAL ERRORS

(1) Parity error
(2) Framing error
(3) Overrun are gated together in IC98

If the composite error signal is required then Link 9 allows data bit 8+ to show these errors.

This will normally be done for 7 bits + parity when bit 8 set will show transmission errors.

For 8 bit operation, Link 8 is fitted when data bit 8+ from the UART is used. Link 8 is to be fitted for Parallel Operation.

INSTRUCTION FORMAT

(1) All instructions preceeded by HEX 10

.....cont'd

INSTRUCTION FORMAT (cont'd

(2) CODE	INSTRUCTION
WRITE BLOCK	31 HEX
WRITE CONT	39
READ BLOCK	30
READ CONT	38
SPACE FWD	32
REV	33
RWD	34
RWD/OFFL	35
WFM	36
STAT REQ	37
CLEAR	3A
EDIT	3B

WRITE BLOCK LENGTH - TOTAL 12 BITS - MAX 4095 decimal
TO BE SENT AS (1) MSB 6 BITS (2) LSB 6 BITS IN LOW ORDER POSITION
BITS 7 CAN BE SET OR NOT + WILL BE IGNORED

I.E. MSB 0000/0001 = 64)
LSB 0000/0010 = 2) 66 CHAR.
BLOCK TO BE WRITTEN.

This can be sent from keyboard in ASCII as "A" then "B" since bit 7 will be ignored

READING

The read block length (total 12 bits) will be sent as (1) MSB 6 bits (2) LSB 6 bits but with bit 7 set in both bytes. This (as in write example) would result in "A" then "B" being transmitted after reading a block of 66 chars.

PARALLEL OPERATION (RC1) - Fit Link 8

If SW2 bit 6 is High and SW7 closed, then the parallel channel is enabled.

DATA + INPUT	BIT	PIN
1		17
2		13
3		9
4		11
5		15
6		19
7		21
8		25
STROBE -		23
ACK -		5

DATA + OUTPUT BIT	PIN
1 +	39
2	41
3	45
4	43
5	33
6	31
7	47
8	35
STROBE -	29
ACK -	37
O/P RDY +	1
GNDS	4→48 EVEN NOS.

IEEE 488 Interface Connections

Interface	Connector	Mnemonic	IEEE 488 Connector
1	SPARE	+5V	-
2	SPARE	-	-
3	SPARE	-	-
4	SPARE	-	-
5		0V	E→N012*
6	SPARE	-	-
7		NRFD	7
8		NDAC	8
9		EOI	5
10		IFC	9
11		DAV	6
12		ATN	11
13		D0	1
14		D1	2
15		D2	3
16		D3	4
17		D4	A
18		D5	B
19		D6	C
20		D7	D

* Note: On IEEE488 Connector E→N 012 are connected together.

ADDRESS SWITCHES ON IEEE 488 INTERFACE

128	64	32	16	8	4	2	1
0	1	0	0	1	0	0	1
	+			+			+

T=64+9=73=
64+
8+
1

TALKER SWITCH 'T'

BIT	SWITCH POSITION
6	1 5. (64) –
5	0 4. (32)
4	0 3. (16) –
3	1 7. (8)
2	0 6. (4)
1	0 2. (2) –
0	1 1. (1).

BIT 0 is L.S.B.
Address is Transferred as a 7 bit word

LISTENER SWITCH 'L'

BIT	SWITCH POSITION
6	0 3. (64)
5	1 4. (32) –
4	0 5. (16) –
3	1 1. (8)
2	0 2. (4)
1	0 6. (2) –
0	1 7. (1)

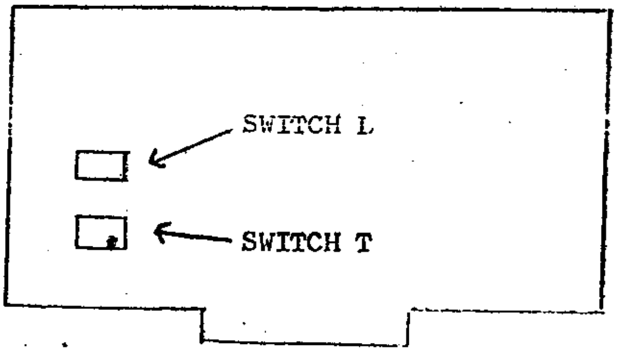
BIT 0 is L.S.B.
Address is transferred as a 7 bit word

128	64	32	16	8	4	2	1
0	0	1	0	1	0	0	1
		+		+			+

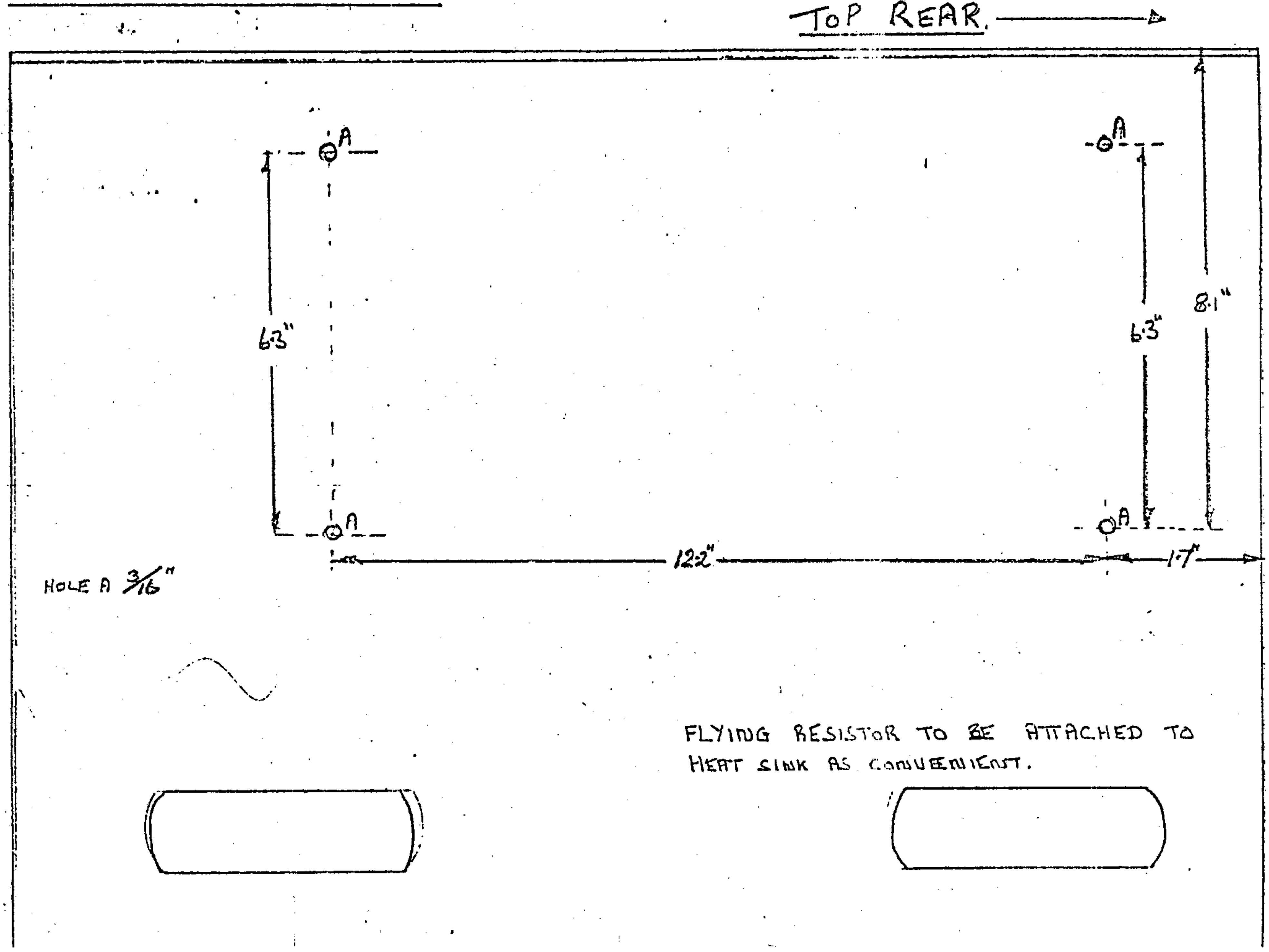
L=32+9=41=
32+
8+
1

EXAMPLE: TALKER ADDRESS 97

'T' Switch 5, 4, 1 ON
Listener address 28
'L' Switch 5, 2, 1 ON



U.B.I. INSTALLATION DRAWING



HOLE A 3/16"

FLYING RESISTOR TO BE ATTACHED TO HEAT SINK AS CONVENIENT.

Robinson

004418901477

EMI

PROVISIONAL SPECIFICATION

EMI8800 MAGNETIC TAPE HANDLER

S.P.

UNIVERSAL BUFFERED INTERFACE

Suitable for:
8 Bit Parallel ('Centronics' Compatible)
IEC/IEEE 488
V24 (RS232C)

751

1.1. INTRODUCTION

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1.3.2. IEC/IEEE 488 Interface PCB, further details on request.

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Tape speed 45ips
Packing density 1600BP1
Block size 2048 bytes
Interblock Gap •6 in.
Average transfer rate 47.5Kcps

without allowing for rewriting where tapes may be faulty.

"Burst" rates may be handled to the maximum.

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2.1. The system can perform 12 different commands: write one block on tape, read on block, space one block in formward direction, backspace one block, rewind, rewind and lockout, write file mark, write continuous, read continuous, clear and edit.

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7 or 9 tracks NRZ

9 tracks PE

COMMANDS EXECUTION

Write One Block on Tape

4.1. Following characters must be sent by the users equipment:

.....1. - DLE

1. - DLE (HEX 10)
2. - WRITE CODE (HEX 31, ASCII 1)
3. - MOST SIGNIFICANT BYTE OF BLOCK LENGTH (BLM.) (6 BITS of 126 WORD)
4. - LEAST SIGNIFICANT BYTE OF BLOCK LENGTH (BLL) (6 BITS of 12b WORD)
5. - DATA WORDS

The data words are stored in a static RAM. When the number of data is equal to the binary number defined by BLM and BLL the content of the memory is transferred onto tape. At the end of this operation two status bytes are transmitted to the users equipment. Composition of both status bytes is explained in 4.10 describing status request command.

If a parity error is detected during the read after write check the system tries automatically 3 times to write data, erasing 3 inches tape, before rewriting the data at a new position.

In case of parity error persisting after 3 retry sequences the tape stops moving and status bytes are transmitted.

Other retry sequences available on request.

Write Continuous.

4.2. Following characters must be sent by the users equipment.

1. - DLE (HEX 10)
2. - WRITE CONT CODE (HEX 39, ASCUII)
3. - MOST SIGNIFICANT BYTE OF BLOCK LENGTH (BLM) (6)
4. - LEAST SIGNICANT BYTE OF BLOCK LENGTH (BLL) (6)
5. - DATA WORDS

The operation is the same as a Write one block, except that after the data words are written to tape, the controller will accept more data. Therefore, a 2nd block can be written to tape without the need for the user to re-issue another write command sequence.

The write continuous instruction will terminate after an unrecoverable parity Error, at which time both status bytes are transmitted. The block lengths of all blocks written to tape will be the same.

4.3. Read One Block From Tape.

1. - DLE (HEX 10)
2. - READ CODE (HEX 30, ASCII 0)

After detection of READ code, tape starts moving, the data block is stored in the buffer memory. When the tape has stopped the following characters are transmitted to the users equipment.

1. - STATUS BYTE 1
2. - STATUS BYTE 2
3. - MOST SIGNIFICANT BYTE OF BLOCK LENGTH (6)
4. - LEAST SIGNIFICANT BYTE OF BLOCK LENGTH (6)

..... 5. - DATA

5. - DATA CHARACTERS

If a parity error is detected the system tries 3 times to read the block. If the block is still in error after 3 retries both status bytes are transmitted.

4.4. Read Continuously.

1. - DLE

2. - READ CONT CODE (HEX 38, ASCII 8)

After detection of the Read Cont code, tape starts moving, the data block is stored in the buffer. When the tape has stopped the following characters are transmitted to the users equipment.

A1 STATUS BYTE 1

A2 STATUS BYTE 2

A3 MOST SIGNIFICANT BYTE OF BLOCK LENGTH (6)

A4 LEAST SIGNIFICANT BYTE OF BLOCK LENGTH (6)

A5 DATA CHARACTERS

After all the data Characters have been accepted by the user, the tape will start moving again and another block will be Read, the sequence of events will now be the same, re-entering the sequence at point A1. The Read Cont instruction will terminate on an unrecoverable parity error, or detection of a File Mark character.

4.5 Space Forward One Block

Characters to be transmitted:-

1. - DLE (HEX 10)

2. - SPACE FORWARD CODE 9 HEX 32, ASCII 2)

After detection of space forward code the tape starts in forward direction, space one block and stops in the inter record gap. At the end of the operation both status bytes are transmitted.

4.6. Space Reverse One Block.

1. - DLE (HEX 10)

2. - SPACE REVERSE CODE (HEX 33, ASCII 3)

Same operation as 4.5 but in reverse mode.

4.7. Rewind

1. - DLE (HEX 10)

2. - REWIND CODE (HEX 34, ASCII 4)

After detection of rewind code tape starts rewinding and stops on BOT (Load point). At the end of the operation both status bytes are transmitted.

.... 4.8

4.8. Rewind and Lockout

1. - DLE (HEX 10)
2. - REWIND AND LOCKOUT CODE (HEX 35, ASCII 5)

After detection of this code tape starts rewinding, goes offline and stops on BOT.

4.9. Write File Mark

1. - DLE (HEX 10)
2. - WRITE FILE MARK CODE (HEX 36, ASCII 6)

After detection of WFM code the tape drive first erases 3" tape and writes file mark code (HEX 13 in 800 CPI NRZ, 40 "zero's" on tracks P, 0, 2,5,6,7 while tracks 1,3, 4 erased in 1600 CPI PE). When tape stops both status bytes are transmitted.

4.10. Status Request

1. - DLE (HEX 10)
2. - STATUS REQUEST CODE (HEX 37, ASCII 7)

When status request is decoded both status bytes are transmitted.

4.10.1 First Status Byte (SB 1)

BIT 0: - CBY

True when a command is accepted and remains true until the operation has finished and all motion has ceased.

BIT 1: - REJECT - formatter busy and any command is issued
- reverse command on BOT
- write or write file mark without write enable ring on the reel.

- NON VALID COMMAND CODE
- TAPE UNIT NOT READY
- PARITY ERROR

1600 CPI PE - correctable error
- uncorrectable error
- false preamble or postamble
- multitrack dropout

800 CPI NRZ - longitudinal parity error
- vertical parity error

BIT 2: - REJECT
- NOT CORRECTLY TRANSMITTED COMMAND

BIT 3: - always "0" [illegible]

BIT 4: - " "1" [illegible]

BIT 5: - " "1" [illegible]

BIT 6: - " "0" [illegible]

BIT 7: - " "0" [illegible]

.....N.B.

N.B. CBY Bit 0 will be set during any Read instruction, until all the data has been accepted by the user.

4.10.2 Second Status Byte (SB 2)

BIT 0: - LOAD POINT (BOT)
BIT 1: - END OF TAPE (EOT)
indicates transport is on or has passed over the end of tape reflective tab. This signal remains true until a reverse direction command is accepted by the system.

BIT 2: - REJECT
BIT 3: - FILE MARK
BIT 4: - PARITY ERROR
- TIMING ERROR
BIT 5: - Always "1"
BIT 6: - " "1"
BIT 7: - " "0"

Both status bytes are always transmitted together:-

- After execution of a WRITE command, a SPACE FORWARD a SPACE REVERSE, a REWIND and a WRITE FILE MARK command.
- In READ, status bytes are transmitted after transfer of the block from tape to memory, before transmitting BLM, BLL and data to users equipment.
- Immediately after reception of a STATUS REQUEST command.
- If character following DLE is not a correct command code.
- If a parity error is detected in a received character.
- When a command is rejected by the formatter.

4.11. Clear

1. - DLE

2. - CLEAR COMMAND (HEX 3A ASCII:)

The Clear Command Resets all control logic in the formatter terminating any instruction if present, and terminating any tape motion.

4.12. Edit

1. - DLE

2. - EDIT COMMAND (HEX 3B ASCII;)

The 'edit' command allows the user to alter specific blocks of data. The sequence is as follows:-

- Read one data block
- Issue 'edit' (Hex 3B ASCII)
- Space back one block
- Write one data block.

The 'edit' command is now automatically reset. 'Edit' may also be reset by the Clear command (see para 4.11)

The 'edit' function effectively adjusts the tape position so that the new data exactly replaces the original data block, also allowing for the start/stop times. Caution should be exercised in ensuring that new data is of the same block length as the original record.

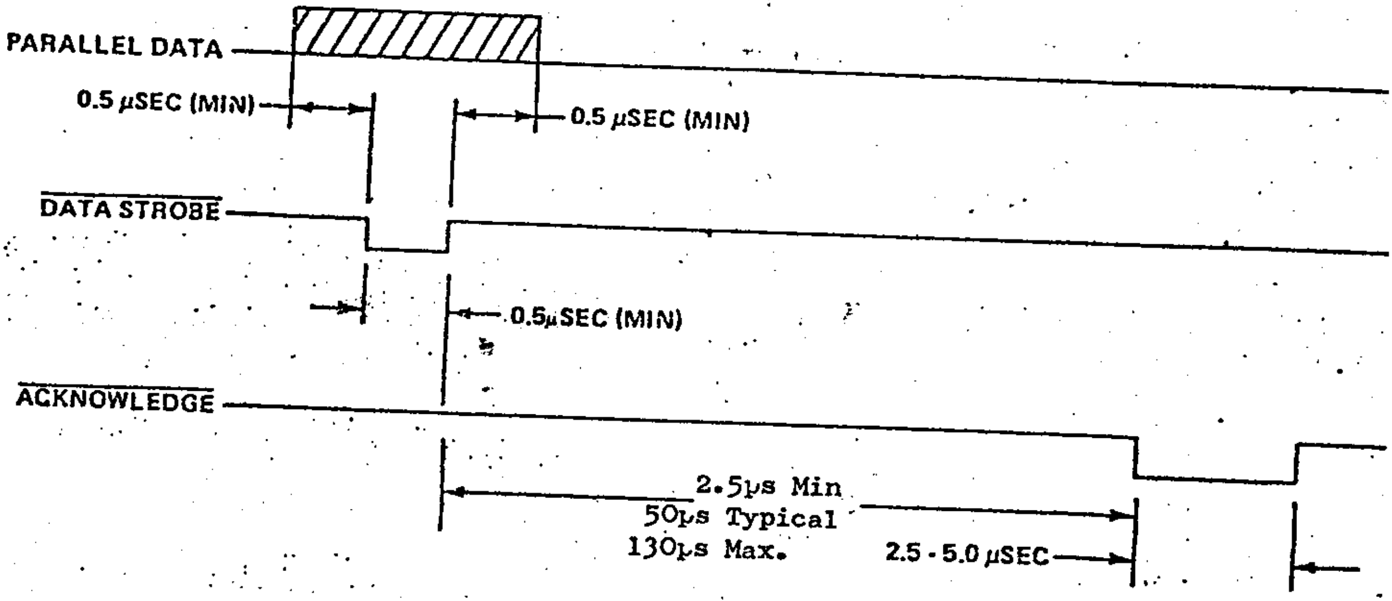
.....5. COMMANDS

5. COMMANDS CODE CHART

COMMAND	HEXADECIMAL CODE	ASCII	BIT 0	1	2	3	4	5	6	BIT 7
DLE	10	DLE	0	0	0	0	1	0	0	0
WRITE	31	1	1	0	0	0	1	1	0	0
READ	30	0	0	0	0	0	1	1	0	0
SPACE FORWARD	32	2	0	1	0	0	1	1	0	0
BACKSPACE	33	3	1	1	0	0	1	1	0	0
REWIND	34	4	0	0	1	0	1	1	0	0
REWIND & LOCKOUT	35	5	1	0	1	0	1	1	0	0
WRITE FILE MARK	36	6	0	1	1	0	1	1	0	0
STATUS REQUEST	37	7	1	1	1	0	1	1	0	0
READ CONT	38	8	0	0	0	1	1	1	0	0
CLEAR	3A	:	0	1	0	1	1	1	0	0
EDIT	3B	;	1	1	0	1	1	1	0	0

5.10.79 PLW/DJ

6. TIMING



Pin connections (8 bit parallel

SIGNAL	INPUT PIN	OUTPUT PIN
data 1+	17	39
data 2+	13	41
data 3+	9	45
data 4+	11	43
data 5+	15	33
data 6+	19	31
data 7+	21	47
data 8+	25	35
Strb. -	23	29
Ack -	5	37
Rdy +	49	1
+5 V PINS 2&50		
Reset (µp generated reset O/P- no conn. necessary)		3
ALE (µp clock pulses O/P - no conn. necessary)		7
GROUND	4 - 48 even pins.	

Connector - standard 50 way ribbon cable

SERIAL PORT CONNECTOR

PIN		SIGNAL
1		-12V VIA 10K
2		+12V VIA 10K
3		OV
4	NC	
5		DSR (not examined)
6	NC	
7		RX DATA TO TAPE UNIT
8		TX DATA FROM TAPE UNIT
9	NC	
10		DTR - SET + TRUE AFTER INITIALISATION

INSTALLATION

Connect OV and +14V Power

Leads to terminal block on back of metal panel.

Fit PCB to panel with SE Labs plastic mounting pillars.

REMOVE three 220/300 resistor packs from bottom of transport mounted formatter. - Fit 3 2K2 Resistor Packs

Fit ribbon cable from lower connector RC3 to 136 way edge connector.
Attach flying resistor to formatter heat sink.

SW1 in position IC110

Baud Rate Switch

1 - N/A nota appl-
2 - 19200
3 - 9600
4 - 4800 x al+
5 - 2400
6 - 1200
7 - 600
8 - 300

Link closed for selected speed. +

.....cont'd

link to gr. = chiuso → + = switch chiuso

– = sw. aperto

SW2 in position IC105

Serial character configuration

chiuso

aperto

1	No Parity	-	High gives no parity ×
2	TSB	-	Low gives 1 stop bit ×
3	NB2	-	L } 6 bits/CHR
4	NB1	-	H }
5	O/EPS	-	LK to GND for ODD Parity ×
6	$\overline{\text{SWE}}$	-	LK to GND for serial CH. Enabled × serial
7	PARALLEL	-	LK to GND for Parallel Operation +

8 → ⏚

NB2	NB1	DATA BITS/CHAR
L	L	5
L	H	6 ×
H	L	7
H	H	8

E.G. for 7 bits plus even parity, 2 stop bits

Links to GND 1, 4, 6

(HIGHS ON 2, 3, 5, 7)

NOTE - **SERIAL ERRORS**

(1) Parity error
(2) Framing error
(3) Overrun are gated together in IC98

If the composite error signal is required then Link 9 allows data bit 8+ to show these errors.

This will normally be done for 7 bits + parity when bit 8 set will show transmission errors.

8 → ⏚

For 8 bit operation, Link 8 is fitted when data bit 8+ from the UART is used. Link 8 is to be fitted for Parallel Operation.

a massa

//: l.6 +

7 ⏚

8 +

INSTRUCTION FORMAT

(1) All instructions preceeded by HEX 10

.....cont'd

INSTRUCTION FORMAT (cont'd

(2) CODE	INSTRUCTION
WRITE BLOCK	31 HEX
WRITE CONT	39
READ BLOCK	30
READ CONT	38
SPACE FWD	32
REV	33
RWD	34
RWD/OFFL	35
WFM	36
STAT REQ	37
CLEAR	3A :
EDIT	3B ;

WRITE BLOCK LENGTH - TOTAL 12 BITS - MAX 4095 decimal

TO BE SENT AS (1) MSB 6 BITS (2) LSB 6 BITS IN LOW ORDER POSITION

BITS 7 CAN BE SET OR NOT + WILL BE IGNORED

I.E. MSB 0000/0001 = 64) 66 CHAR.
LSB 0000/0010 = 2) BLOCK TO BE WRITTEN.

This can be sent from keyboard in ASCII as "A" then "B" since bit 7 will be ignored

READING

The read block length (total 12 bits) will be sent as (1) MSB 6 bits (2) LSB 6 bits but with bit 7 set in both bytes. This (as in write example) would result in "A" then "B" being transmitted after reading a block of 66 chars.

PARALLEL OPERATION (RC1) - Fit Link 8

If SW2 bit 6 is high and SW7 closed, then the parallel channel is enabled.

DATA + INPUT BIT	PIN
1	17
2	13
3	9
4	11
5	15
⑥	19
7	21
8	25
STROBE -	23
ACK -	⑤

DATA + OUTPUT BIT	PIN
1 +	39
2	41
3	45
4	43
5	33
6	31
7	47
8	35
STROBE -	29
ACK -	37
O/P RDY +	1
GNDS	4→48 EVEN NOS.

IEEE 488 Interface Connections

Interface	Connector	Mnemonic	IEEE 488 Connector
1	SPARE	+5V	-
2	SPARE	-	-
3	SPARE	-	-
4	SPARE	-	-
5		0V	E→N012*
6	SPARE	-	-
7		NRFD	7
8		NDAC	8
9		EOI	5
10		IFC	9
11		DAV	6
12		ATN	11
13		D0	1
14		D1	2
15		D2	3
16		D3	4
17		D4	A
18		D5	B
19		D6	C
20		D7	D

* Note: On IEEE488 Connector E→N 012 are connected together.

ADDRESS SWITCHES ON IEEE 488 INTERFACE

TALKER SWITCH 'T'

BIT	SWITCH POSITION
6	5 (64)
5	4 (32)
4	3 (16)
3	7 (8)
2	6 (4)
1	2 (2)
0	1 (1)

BIT 0 is L.S.B.
Address is Transferred as a 7 bit word

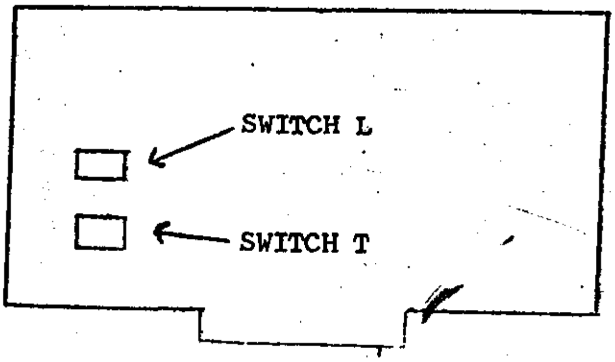
LISTENER SWITCH 'L'

BIT	SWITCH POSITION
6	3 ✓ (64)
5	4 ✓ (32)
4	5 ✓ (16)
3	1 ✓ (8)
2	2 ✓ (4)
1	6 ✓ (2)
0	7 ✓ (1)

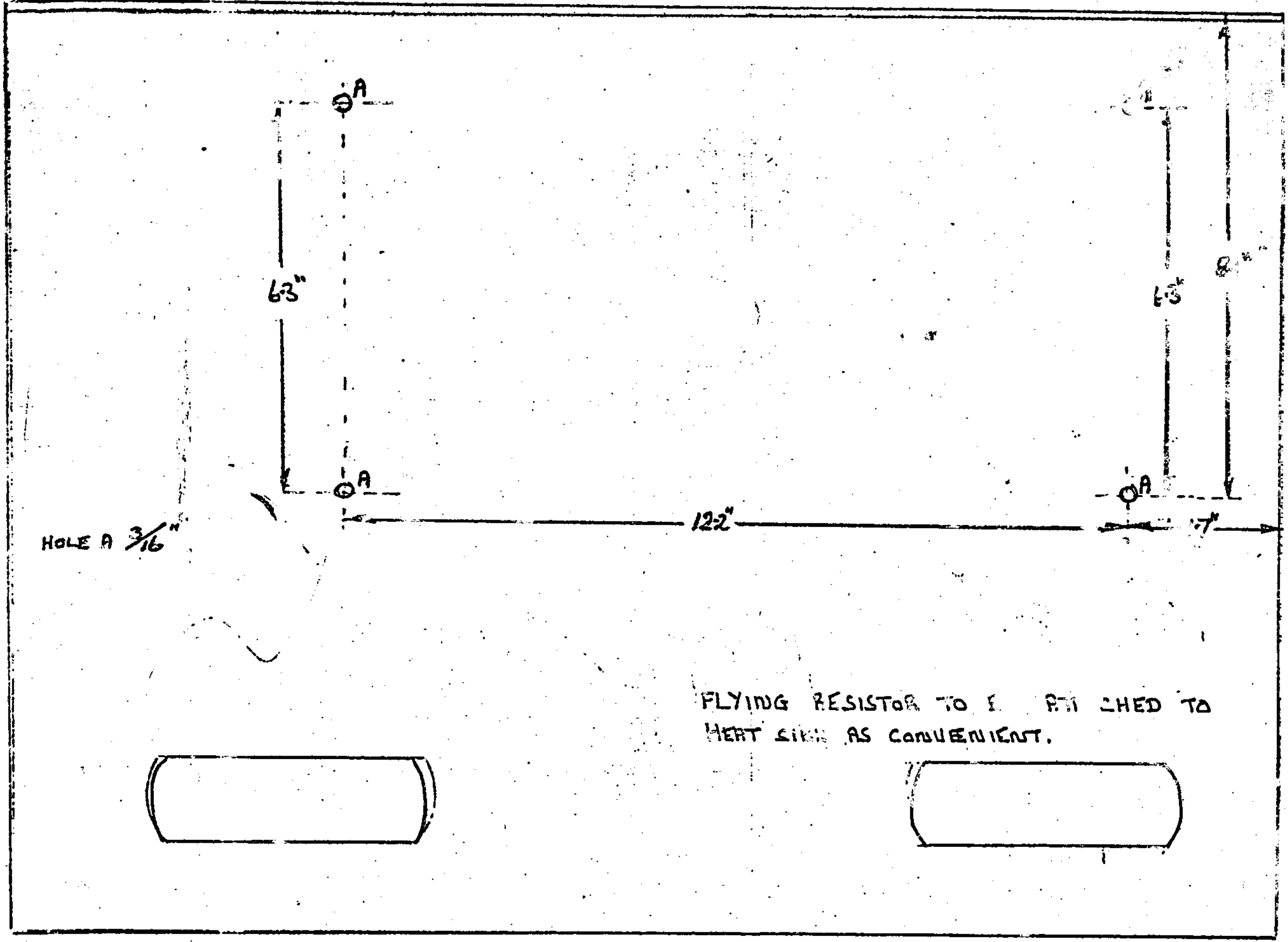
BIT 0 is L.S.B.
Address is transferred as a 7 bit word

EXAMPLE: TALKER ADDRESS 97
'T' Switch 5, 4, 1 ON = schiacciati dal lato +
Listener address 28
'L' Switch 5, 2, 1 ON

arrivato con:
P. L. A 64 + 18
P. T. A. 32 + 18
posto a: 64 } + 18
32
T
L



TOP REAR. →



HOLE A 3/16"

FLYING RESISTOR TO BE ATTACHED TO HEAT SINK AS CONVENIENT.